

**Seismic Hazard of Puget sound (SHIPS): collaborative Research with U.S.
Geological Survey, Oregon State UNIV., UNIV. of Texas at EL Paso, UNIV. of
British Columbia, UNIV. of Washington, UNIV. of Victoria, Pacific Geosciences
Center**

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Element I- Evaluation National and Regional Hazard and Risk

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Abstract

The heavily populated Puget Basin is underlain by thick sequences of Cenozoic sedimentary rocks that amplify and focus seismic energy, thus increasing ground shaking during and earthquake. The SHIPS (Seismic Hazard Investigations of Puget Sound) project is target at acquiring and analyzing controlled-source seismic data to be used in modeling and mapping areas of expected strong ground shaking and at better determining the regional velocity structure and tectonic framework of the Puget Sound region, including the location , configuration, and seismic properties of faults that cross the urban region. This project represents the first phase of SHIPS. Data were acquired during March, 1998, and include marine multichannel seismic data, expanding spread profiles, and ocean-bottom on onshore/offshore large-aperture recording of marine airgun shots. A total of some xx at Oregon State University has focussed on the structure beneath the Straits of Juan de Fuca and beneath the core of the Olympic Mountains, and precisely defines deformation of the subducting plate where it bends sharply to the north. This study also provides new constraints on deformation of the overriding plate and on the evolution of plate boundary reflectivity. While this region is west of the zone of greatest earthquake activity, understanding the deformation here is critical for typing the structure beneath Puget Sound to that beneath the well-image continental margin and for interpreting the tectonic causes of seismicity further east.

A preliminary 2-dimensional model of the crust and upper mantle, including the region of the Juan de Fuca/ North America plate boundary, was presented at the Fall of 1998, meeting of the American Geophysical Union. The model was refined somewhat and presented at the spring 1999 meeting of the Seismological Society of America. A second presentation at that meeting compared the results to results of similar studies elsewhere along the Cascadia subduction zone. This work was expanded to a 3-dimensional model

of the upper crust beneath at larger region for the fall 1999, AGU meeting. In the study, the Moho of the Juan de Fuca plate is proxy for deformation of the plate as a whole. We are currently in the process of preparing these results for publication.